Advancing energy through algorithms

David Keyes*

In developing both plasma fusion and next generation fission concepts, simulations are expected to guide expensive experimental programs. We review the algorithmic agendae of recent reports of the U.S. Department of Energy for these novel energy technologies, and illustrate with prototype and at-scale distributed computations of PDE type. We point out where today's algorithms of choice are likely to be shoaled by memory or memory bandwidth limitations of emerging architectures.

*Department of Applied Physics & Applied Mathematics, Columbia University